

# ACUTE EFFECTS OF OZONE AND PM<sub>10</sub> ON PEAK EXPIRATORY FLOW: A PANEL STUDY OF SCHOOLCHILDREN IN THE WESTERN BRAZILIAN AMAZON

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**Background and Aims:** Epidemiological studies suggest significant effects on health caused by exposure to air pollutants. The purpose of this study was to evaluate the acute effects of exposure to O<sub>3</sub> and to PM<sub>10</sub> in the peak expiratory flow (PEF) of schoolchildren, in the western Brazilian Amazon.

**Methods:** Panel study with a sample of 279 schoolchildren from 6 to 15 years old. Repeated measures of PEF were carried out during 97 days, in the dry season. Daily measurements of O<sub>3</sub>, PM<sub>10</sub>, temperature, humidity as well as respiratory symptoms were recorded. Other individual characteristics, such as weight, height, and spirometry were measured. Further, a questionnaire was answered by child's responsible. The analysis was based on mixed effects models. The effects of pollutants were evaluated considering levels on the current day, 1 to 3 days lag and cumulative effects of 2 and 3-days. The variance function of random error was estimated.

**Results:** The overall average of the PEF was 276.53 l/min. Averages of PM<sub>10</sub> ranged from 6.1 to 108.6 µg/m<sup>3</sup> and averages of O<sub>3</sub> varied from 0.25 to 57.25 µg/m<sup>3</sup>. The estimated models consisted of: i) temporal trends, temperature and humidity lagged by 2-days, fitted via quadratic parametric splines with random coefficients; ii) respiratory symptoms with random coefficients; iii) individual characteristics such as height, weight, gender, asthma diagnosis (ISAAC), and the ratio FEV1/FVC. Adjusted models revealed significant effects of the exposure to PM<sub>10</sub> and O<sub>3</sub>. For each increase of 10µg/m<sup>3</sup>, there was a reduction in the PEF average ranging from 0.72 to 0.83 l/min for PM<sub>10</sub> on the 3 days lag. For an increase of 10µg/m<sup>3</sup> of O<sub>3</sub>, the PEF average decrease varied between 2.28 to 4.26 l/min for all exposure evaluated, except for the current day levels.

**Conclusions:** We observed a significant association between PEF and levels of air pollutants.